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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,197	11/25/2003	Hideaki Okamura	60188-717	4226

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Jack Q. Lever, Jr.  
McDERMOTT, WILL & EMERY  
600 Thirteenth Street, N.W.  
Washington, DC 20005-3096

EXAMINER

NGUYEN, DILINH P

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/720,197

Applicant(s)

OKAMURA ET AL.

Examiner

DiLinh Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/25/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

Claim 6 recites the limitation "the line width". There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitations the value, the height and the line width. There is insufficient antecedent basis for these limitations in the claim.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as failing to comply with the enablement requirement.

Regarding claim 1, lines 6-7, the phrase: "...exposed to the gas containing sulfur" contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains. It is not clear how the resist pattern exposed to the gas containing sulfur?

Regarding claim 7, the phrase "the value of the ratio of the height of the resist pattern to the line width thereof is 2.8 or more" contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains. It is not clear how the ratio of the height to the line width is 2.8 or more?

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-2 and 5-6, in-so-far as clear, are rejected under 35 U.S.C. 102(e) as being anticipated by Desphande et al. (U.S. Pat. 6869542).

Desphande et al. disclose a method for fabricating a semiconductor device, comprising the steps of:

forming a thin film 14 made of an inorganic material [ $\text{SiO}_2$ ] (fig. 4A, column 6, lines 21-22);

forming a resist film HM containing carbon on the thin film and thereafter patterning the formed resist film to form a resist pattern from the resist film (fig. 4A, column 10, lines 51-60);

exposing the resist pattern to a gas containing sulfur (figs. 4A-4B, claim 13, line 8);

performing dry etching of the thin film 14 using as a mask resist pattern (fig. 4B, claim 13, lines 23-27).

- Regarding claim 2, Desphande et al. disclose that the inorganic material contains silicon (column 6, lines 21-22) and an etching gas employed for the dry etching is a fluorocarbon gas (claim 15, line 5).

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- Regarding claim 5, Desphande et al. disclose that the step of exposing the resist pattern to the gas containing sulfur and the step of performing dry etching constitute the same step (fig. 4B, claim 13, lines 17-23).
- Regarding claim 6, Desphande et al. disclose that a line width of the resist pattern is 200 nm or less (fig. 4B, column 7, line 26).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desphande et al. (U.S. Pat. 6869542) in view of Zhou et al. (U.S. Pat. 6358842).

Desphande et al. do not explicitly disclose the gas containing sulfur is sulfur dioxide.

However, Zhou et al. disclose that the gas containing sulfur is sulfur dioxide (column 8, lines 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process step of Desphande et al. by having the sulfur dioxide to perform the etching step, as taught by Zhou et al., in order to form a sidewall passivation layer without any additional processing steps (column 8, lines 5-14).

- Regarding claim 4, Zhou et al. disclose the gas containing sulfur is in a plasma state (column 7, line 61).


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN

  
HOA PHAM  
PRIMARY EXAMINER